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REMARKS

The Examiner rejected claims 1-4 under 35 U.S.C. 103(a) as being unpatentable over Lusignan et al (U.S. Patent No. 5,391,983 – "Lusignan") in view of Holcomb (U.S. Patent No. 5,115,189) {claims 1 and 4}, further in view of Ward (U.S. Patent No. 6,571,189 [?should be 6?]) {claim 2} or further in view of Dick et al (U.S. Patent No. 6,333,649 – "Dick") {claim 3}. Applicants respectfully traverse this conclusion by the Examiner.

Applicants' claimed invention is a method of image alias rejection using shaped statistical filtering in a waveform rasterizer. When rasterizing a high resolution waveform (2048x2048) onto a limited, or lower, resolution display (640x480), artifacts appear in the rasterized waveform (bit-map display) that are sometimes called "jaggies", i.e., the spatial aliases of an undersampled image. A waveform rasterized in a much higher resolution may be subjected to an appropriate lowpass spatial filter which "smears" the points over several neighboring pixels, and then subsampled to the desired lower or limited display resolution. However this approach requires a very large raster memory that is very fast. Where a 2x2 spatial kernel is used for lowpass filtering during rasterization, four memory cycles are needed to plot the output of the spatial filter, which due to limited memory bandwidth is not desired. In summary the method of the present invention dithers high resolution "X" and "Y" data with a value from a shaped random number generator. The combined "X" and "Y" values are then truncated as appropriate for a lower resolution display and stored in a display raster memory. This eliminates the need for a high resolution memory and does not use multiplication. The present invention uses a shaped statistical filter which has a random shaped function representing a probability density

function for the impulse response of the filter being used. The statistical filter places each data point into a single bin based on the probability density function of the filter, which over time resembles a traditional filter with an impulse response matching the probability density function of the statistical filter. The probability density function corresponds to a rectangular impulse response generated by a random number generator.

In contradistinction to Applicants' claimed invention Lusignan discloses a power usage meter that adds a dither signal, either triangular or sinusoidal, to a current signal prior to digitization by an analog-to-digital converter (ADC) when the current is read at low levels below the resolution level of the ADC, i.e., the purpose of the dither signal is to allow the ADC to measure currents at low levels.

Applicants recite image alias rejection of a high resolution rasterized waveform, not a power usage meter for reading low current levels, that generates a shaped dither signal to simulate a statistical filter having a probability density function. The shaped dither signal is summed with a dimensional component value of each data point, i.e., X and/or Y component value which is not an analog signal as in Lusignan, to produce filtered data point values. The purpose of the dither signal in Lusignan is not to produce filtered data point values, but to allow more samples of the waveform at low current levels to be taken for greater measurement accuracy. Therefore Lusignan neither teaches nor suggests the first two elements of claims 1 and 4.

Likewise Holcomb deals with preventing aliasing while sampling a low frequency analog input signal, not with eliminating image aliasing of a high resolution rasterized waveform. Holcomb uses one clock pulse out of every N sample clock pulses randomly to store sample values from the ADC. Applicants recite in claims 1 and 4 subsampling the

filtered data point values, not a clock used for storing ADC output values randomly, to produce a lower resolution rasterized waveform for display. Holcomb does not produce a lower resolution rasterized waveform for display, but rather seeks to prevent a high frequency signal from appearing as a very low frequency signal, i.e., seeks to provide a higher resolution display (compare Figs. 7 and 8). Therefore combining Holcomb with Lusignan provides a means for displaying low level currents as a proper frequency signal rather than as a much lower frequency signal. This does not produce Applicants' claimed invention which dithers X/Y coordinate data values (not an analog signal) and then subsamples to produce a lower resolution waveform image from the high resolution waveform data. Thus claims 1 and 4 are deemed to be allowable as not being obvious to one of ordinary skill in the art over Lusignan in view of Holcomb.

Claims 2 and 3, dependent from claim 1, also are deemed to be allowable as not being obvious to one of ordinary skill in the art over Lusignan in view of Holcomb and further in view of Ward or Dick.

In view of the foregoing remarks allowance of claims 1-4 is urged, and such action and the issuance of this case are requested.

Respectfully submitted,

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